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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/978,274	10/15/2001	Chrisotpher John Robert Thomas	9341-028-999	4439

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11/16/2004

EXAMINER
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IBRAHIM, MEDINA AHMED

ART UNIT	PAPER NUMBER
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1638

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/978,274

Applicant(s)

THOMAS ET AL.

Examiner

Medina A Ibrahim

Art Unit

1638

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4,22-24,28,29,31,33,34 and 36-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,22-24,28,29,31,33,34 and 36-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Applicant's response filed 08/24/04 in reply to the Office action mailed 02/25/04 has been entered. Claims 1-4, 22-24, 28-29 and 36-38 have been amended. Claim 35 has been cancelled. Claims 39-45 have been added. Therefore, claims 1-4, 22-24, 28-29, 31, 33-34, 36-45 are pending and are under consideration.

All previous rejections and objections not set forth below have been withdrawn in view of Applicant's amendment.

#### ***Priority***

Applicant has not complied with the conditions for receiving benefit of the foreign filing date because a certified copy of the foreign priority application as required by 35 U.S.C. 119(b) has not been submitted. In the responses, Applicant has repeatedly indicated that the certified copy of the foreign document will be submitted at a later time. However, this indication will not entitle Applicant to receive the benefit of the foreign filing date; i.e., 10/14/2000. The effective filing date of this application is considered to be 10/15/2001.

#### ***New Matter***

Claims 1, 29, 33-34 and 38 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a NEW

MATTER rejection.

Claim 1 recites "with the proviso that the specific cells do not consist of pollen cells". In the response of 11/25/03, on page 20, Applicant argues that the genus of targeted cells including pollen, anther, and tapetum cells, which are disclosed in the specification provides sufficient support for the amendment adding the proviso. Applicant cites MPEP 2173.05(i), to support this position. Examiner responds that the negative exclusionary that excludes pollen from the rest of members of the genus has no basis in the specification or in the claims as originally filled, as required by the MPEP 2173.05 (i). While the specification provides support for the genus of target cells including pollen, anther and tapetum cells, there is no support for the limitation that excludes the pollen cells. Nowhere in the specification where all members of the genus "except pollen" are used as target cells, or where Applicant has contemplated anther and tapetum cells only as the specific target cells. Therefore, the *In re Johnson*, 558 F.2d 1008, 1019, 194 U.S.P.Q. 187, 196 (CCPA 1977), does not appear to support Applicant's position. Therefore, the limitation "with the proviso that specific cells do not consist of pollen cells" is considered to be a new matter. Applicant is required to delete the NEW MATTER in response to this rejection.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 22-24, 28-29, 31, 33-34, 36-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-4, 22-24, 28-29, 31, 33-34, 36-45 are indefinite because it is unclear what is encompassed by and how to stimulate the "natural development" of a plant. It is also unclear whether it is the plant or the promoter that is responsive to the pathogen or chemical. The claims are also indefinite because what is encompassed by "changes in flower morphology" and "seed release".

Claims 1-4, 22, 36-37, 39-45 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: specific promoters controlling expression of the mature pokeweed that result in disruption of nematode infection, changes in flower morphology, male sterility, abscission, seed release, and prevention of trichome development.

Claims 28, 33 and 39 are indefinite in the recitation of "promoter is induced in. ...cells adjacent to..... " because promoters for adjacent cells as listed in the claims are unknown to one of ordinary skill in the art, and are not defined in the specification. Also, it is unclear how to achieve the disruption of nematode infection, changes in flower morphology, male sterility, abscission, seed release, and prevention of trichome development, if the PAP is expressed in cells adjacent to the target cells and not in the target cells.

Claim 31 is indefinite in the recitation of "DNA isolate of a chimaeric gene of Claim 4" because claim 4 is drawn to a method rather than a chimaeric gene. It is also unclear which part of the chimaeric gene is the intended DNA isolate. Clarification is required to more clearly define the metes and bounds of the claim.

***Claim Rejections - 35 USC § 112***

Claims 40, 42 and 44-45 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of inducing necrotic effect in specific cells of a plant by expressing pokeweed antiviral protein (PAP) encoding sequences of SEQ ID NO: 1, 3, 5, or 7 in said cells and plants and plant cells produced by said method, does not reasonably provide enablement for a method that employs a sequence that is 70% homologous to SEQ ID NO: 3, 5, or 7 a sequence having at least 80% homologous to SEQ ID NO: 4, 6, or 8 and retaining ribosome inactivating activity. This rejection is repeated for the reasons of record as set forth in the last Office actions of 07/31/03 and 02/25/04. Applicant's arguments filed 08/24/04 have been considered but are not deemed persuasive.

Applicant argues that the claims recite percent of homology to either the coding region or the protein (structure) sequences, and require that the nucleic acids encode a PAP protein having ribosome inhibiting activity. Applicant, therefore, asserts that one skilled can practice the invention without undue experimentation (pages 10-12, response).

These arguments are not persuasive for the reasons of record. The 70% and 80% percent homologous sequences encompass sequences with multiple of modifications in domains of the PAP sequences of PAP-S  $\alpha$  and PAP-S $\beta$  (SEQ ID NO: 3-8) that are critical for PAP function. Applicant has not provided guidance with regard to where and how the sequences of SEQ ID NO: 3, 5, or 7 can be modified so as the resultant homologous sequences encode PAP proteins having the desired ribosome inhibiting activity, i.e., activity that results in disruption of nematode infection, changes in flower morphology, male sterility, abscission, seed release, and prevention of trichome development in any transgenic plant. Applicant has not provided guidance with regard to where and how the sequences of SEQ ID NO: 4, 6, or 8 can be modified so as the resultant homologous sequences retain the desired ribosome inhibiting activity, i.e., activity that results in disruption of nematode infection, changes in flower morphology, male sterility, abscission, seed release, and prevention of trichome development in exemplified and non-exemplified plant species.

Furthermore, upon further search of the prior art, it has been determined that not all plant species are equally responsive to ribosome inactivating proteins from a different plant species, and that the effect of said proteins on plant's ribosome is highly variable. See, for example, Stripe et al. (Biotechnology, vol 10, pp. 405-412 (1992) and Hey et al (Plant Physiology, vol. 107:1323-1332 (1995). See also, Lodge et al; Barbieri et al; and Tumer et al disclosed in the Office action of 07/31/03. Applicant's own specification teaches that a method for expressing a mature PAP-S failed to produce transgenic tobacco plant, while no difficult in producing transgenic potato plants

expressing same mature PAP-S. Therefore, it is uncertain as to whether the claimed methods of inducing necrotic effects by expressing exemplified or non-exemplified PAP sequences in any transgenic plant would result in disruption of nematode infection, changes in flower morphology, male sterility, abscission, seed release, or prevention of trichome development in any transgenic plant.

Therefore, for the reasons discussed above and in the last Office actions, the claimed invention is not enabled throughout the broad scope. Therefore, the rejection is maintained.

#### ***Written Description***

Claims 1-4, 22-23, 28-29, 31, 33-34, 36-38, 40, 42 and 44-45 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This rejection is repeated for the reasons of record as set forth in the last Office actions of 07/31/03 and 02/25/04. Applicant's arguments filed 08/24/04 have been considered but are not deemed persuasive.

Applicant argues that the claimed invention is adequately described, given the structural and functional elements recited in the claims. This is not persuasive because Applicant has provided no evidence showing that all sequences having at least 70% homologous to SEQ ID NO: 3, 5, or 7 and 80% homologous to SEQ ID NO: 4, 6 or 8 with retain functional activity as claimed in the claimed methods. Claim 1-4, 22-23, 28-29, 31, 33-34, 36-38 are included in the rejection because the claims fail to recite



specific SEQ ID NO: for the pro-PAP-S, mature PAP-S, PAP-S  $\alpha$  and PAP-S $\beta$ . The claimed method also fail to recite specific promoter required for the expression of PAP protein that would result in the disruption of nematode infection, changes in flower morphology, male sterility, abscission, seed release, or prevention of trichome development in the transgenic plant. Therefore, the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that one skilled in the art would recognize that Applicants are in possession of the invention as broadly claimed, as stated in the last Office actions. Therefore, the rejection is maintained.

***Claim Rejections - 35 USC § 103***

Claims 1-4, 22-24, 28-29, 31, 33-34, 36-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanieswski et al (6, 015, 940) in view of Baszczyński et al (5,756, 324). This rejection is repeated in- part for the reasons of record as set forth in the last Office actions of 07/31/03 and 02/25/04. Applicant's arguments filed 08/24/04 have been considered but are not deemed persuasive.

Applicant argues that none of cited references alone or in combination with others suggest the use of pro-PAP-S, mature PAP-S, PAP-S  $\alpha$  and PAP-S $\beta$  to induce necrotic effects, let alone use of pro-PAP-S, mature PAP-S, PAP-S  $\alpha$  and PAP-S $\beta$  for disruption of nematode infection, changes in flower morphology, male sterility, abscission, seed release, or prevention of trichome development in a transgenic plant.

These arguments are not found persuasive for the reasons of record. Applicant's arguments that Kanieswski et al teach a method of inducing viral resistance against

infection from outside, and do not teach PAP expression to selectively cause necrotic effects in specific cells of a transgenic plant are not persuasive because Kanieswski et al need not to teach all claim limitations, since the rejection is one of obviousness and not one of anticipation. In addition, the definitions of necrotic effects in the specification do not exclude resistance against outside infection in the plant. Kanieswski et al is relied upon because the reference provides a method of transforming tobacco and potato plants and plant cells with a chimaeric gene comprising a DNA sequence encoding PAP or a mutant thereof retaining PAP activity in a tissue-specific or inducible manner. The reference the cited reference suggests expressing the pokeweed antiviral protein in a tissue-specific manner in cells where viral infection is known to occur.

Baszczyński et al teach expression of gene encoding pokeweed antiviral protein under the control of the microspore-specific promoter of Bnm1. The reference teaches that the microspore-specific promoter of Bnm1 induces gene expression in the microspores of transgenic plants beginning at the uninucleate stage of development as well as in tapetal cells to produce male sterile plants. Since PAPs are ribosome-inhibiting proteins and are known to inactivate plant ribosomes (see column 1, lines 44-50), the necrotic effect in specific cells is expected.

In addition, Applicant's argument that neither Kanieswski nor Baszczyński suggests necrotic effect by PAP is not persuasive because PAPs are known in the prior art to induce protein synthesis inhibiting activities in plants. Kanieswski teaches antiviral activity by PAPs in a transgenic plant, and suggest cell-specific expression of the PAP. Baszczyński teaches cell-specific expression of PAP. One of ordinary skilled in the art

Art Unit: 1638

would have been motivated to use PAP encoding sequences to induce necrotic effect and/or viral resistance in specific cells of a plant, with a reasonable expectation of success. The PAP sequences disclosed by Kanieswski or Baszczynski either has at least 70% sequence identity to Applicant's SEQ ID NO: 1, 3, 5, or 7 and/or encode PAP proteins having at least share 80% identity to Applicant's SEQ ID NO: 2, 4, 6, or 8.

While one of the cited reference teach or suggests the use of a chimaeric construct comprising the disclosed sequences of SEQ ID NO: 1, 3, 5, or 7 under the control of KNT1 promoter to induce necrotic effects that results in disruption of nematode infection, the rejected claims are not limited to the use of such chimaeric construct.

In addition, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

#### **Remarks**

No claim is allowed.

#### **Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Medina A. Ibrahim whose telephone number is (571) 272-0797. The Examiner can normally be reached Monday -Thursday from 8:00AM to 5:30PM and every other Friday from 9:00AM to 5:00 PM. Before and after final

Art Unit: 1638

responses should be directed to fax nos. (703) 872-9306 and (703) 872-9307, respectively.

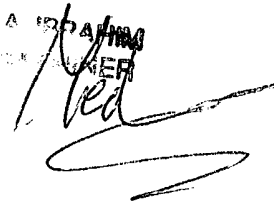
If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dr. Amy Nelson, can be reached at (571) 272-0804.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

11/15/04

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MEDINA A. [illegible]  
PATENT [illegible]

A handwritten signature in black ink, appearing to be 'Med', written over the stamp.